2 Description of the Proposed Action

2.0 DESCRIPTION OF THE PROPOSED ACTION

This section describes the action proposed by BHP Billiton LNG International, Inc., (BHPB, or the Applicant). Alternatives are described in Section 3. Information in this section was obtained primarily from the application for a deepwater port (DWP) license at Cabrillo Port (BHPB August 2003; September 2003).

2.1 OVERVIEW

The Applicant is proposing to construct and operate a floating storage and regasification unit (FSRU) in Federal waters off the coast of Ventura and Los Angeles Counties in Southern California. The proposed Project would have four main types of facilities:

- An offshore DWP liquefied natural gas (LNG) import terminal (the FSRU) that would be anchored and moored on the ocean floor for the life of the Project;
- Offshore pipelines;
- A shore crossing, using horizontal directional drilling (HDD) below the beach and a connection to the existing onshore natural gas infrastructure; and
- Onshore pipelines and related facilities.

The Applicant's stated Project design life is 40 years, although the Federal license for the proposed DWP would have no expiration date.

The Project would require installation of an FSRU, new offshore pipelines, construction onshore of new pipelines and a new metering station, and expansion or modification of three existing onshore valve stations within Ventura County and the cities of Oxnard and Santa Clarita. Construction of the DWP would be completed in 2008/2009. The proposed Project operations would include the following activities (see Figure 2.1-1):

- Shipment within U.S. territorial waters of LNG to the FSRU in special cryogenic tank ships (LNG carriers);
- Transfer of the LNG from the LNG carriers to the FSRU approximately two to three times per week;
- Heating of the LNG under controlled conditions to return it to its gaseous form as pipeline-quality natural gas;
- Transportation of the natural gas from the FSRU to shore via two pipelines laid on the ocean floor; and
- Delivery of the natural gas through onshore pipelines interconnecting with the existing Southern California Gas (SoCalGas) natural gas system. The onshore pipelines would be constructed, owned, and operated by SoCalGas, a natural gas utility regulated by the California Public Utilities Commission (CPUC).

Only LNG carrier vessels and the FSRU itself would handle LNG; both the offshore and onshore pipelines would carry only conventional natural gas.

2.2 PROJECT LOCATION

The FSRU would be installed about 12.2 nautical miles (NM) (14 miles or 22.4 kilometers [km]) offshore of the coast of Ventura County and Los Angeles County, California, in Federal waters approximately 2,900 feet (884 meters [m]) deep.[1] As shown on Figure 2.2-1, the position of the FSRU is approximately:

- 2.4 NM (2.8 miles or 4.5 km) from the eastern boundary of the Point Mugu Sea Range;
- 2.5 NM (2.9 miles or 4.7 km) from the centerline of the nearest shipping lane;
- 10.8 NM (12.4 miles or 20 km) from the nearest existing boundary of the Channel Islands National Marine Sanctuary (CINMS);
- 12.2 NM (14.0 miles or 22.5 km) southwest of the nearest landfall, near Arroyo Sequit near the Los Angeles County boundary;
- 15.1 NM (17.4 miles or 28 km) from the nearest boundary of the Channel Islands National Park (CINP); and
- 16 NM (18.4 miles or 29.6 km) southeast of Anacapa Island.

Table 2.2-1 provides a description of the general location and specific coordinates for the various Project facilities. The Project would also require exclusive rights-of-way (ROWs) on land and on the seabed for normal operation and maintenance; these requirements are summarized in Table 2.2-2. Additional space required temporarily during construction is listed in Table 2.2-3.

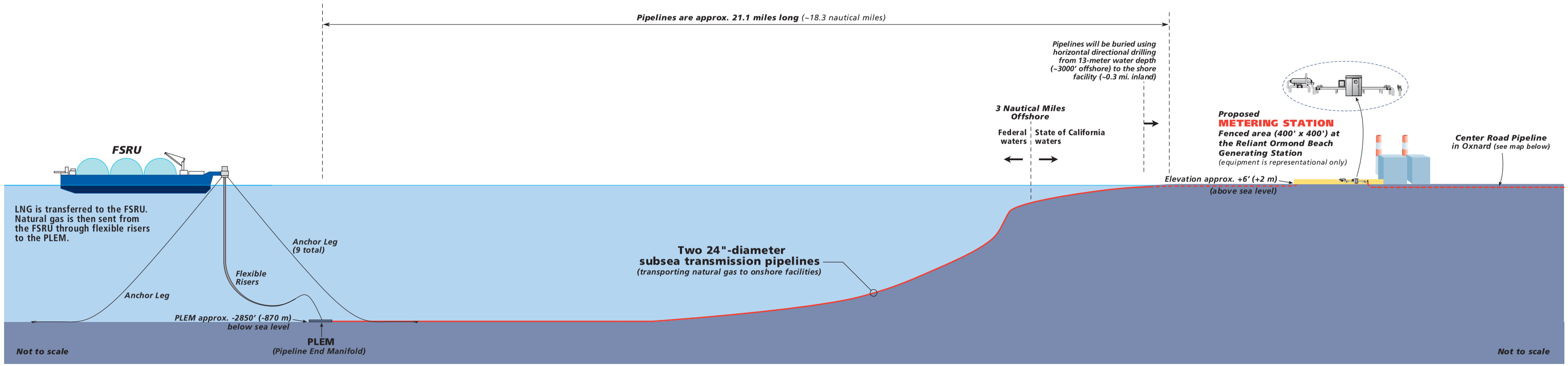
2.3 DESCRIPTION OF THE PROPOSED FACILITIES

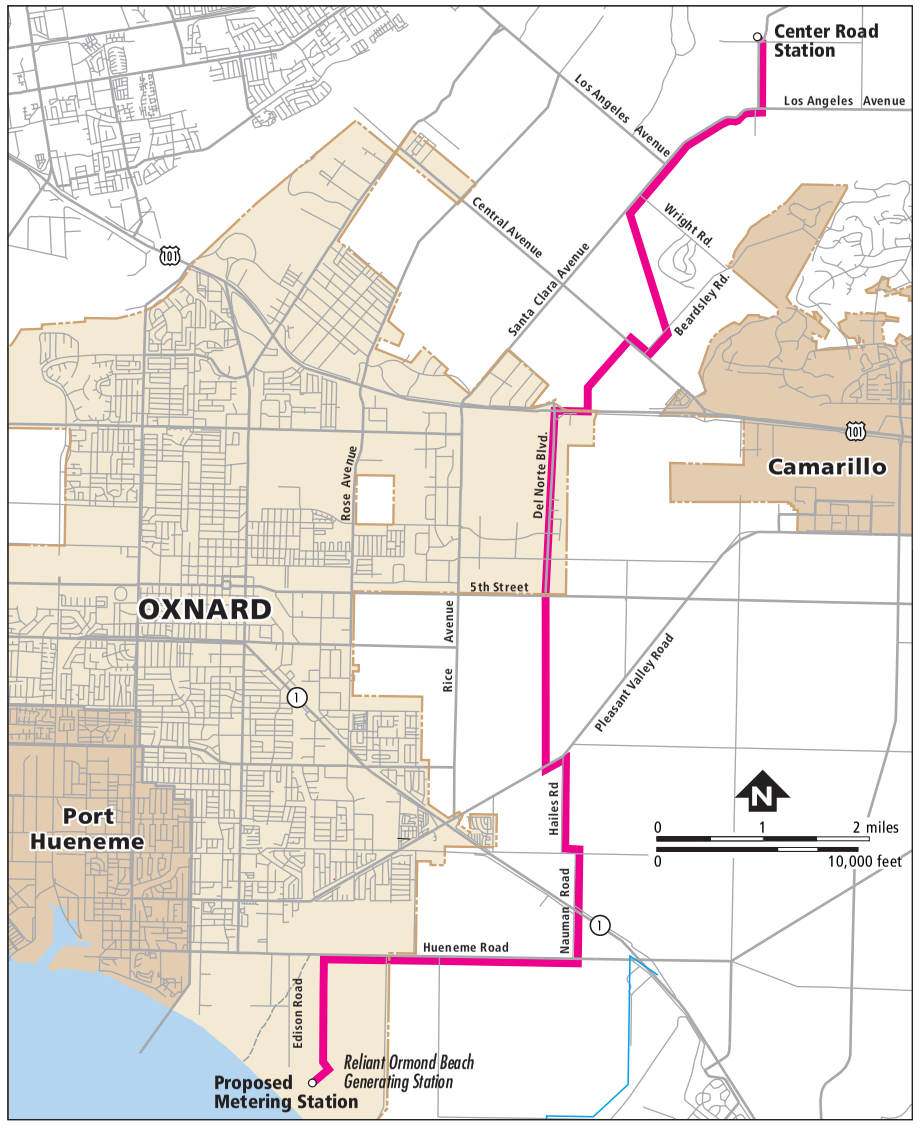
A list of the design standards proposed for the facilities is presented in Section 4.2, "Public Safety." The Project design life would be 40 years.

At present, a broad range of codes and standards exists for the design, construction/ fabrication, and operation of floating vessels, facility structures, platforms, and onshore LNG facilities. While no single standard directly addresses the concept of the proposed FSRU, the FSRU is based on existing related facilities, and individual elements are addressed in various codes (e.g., referenced rules within the *Guide for Building and Classing Offshore LNG Terminals [American Bureau of Shipping 2004]*).

[1] This Environmental Impact Statement/Environmental Impact Report (EIS/EIR) uses nautical miles (NM) as the preferred unit for all large distances referred to in offshore discussions and statute miles for all large distance onshore (1 NM ≈ 1.15 statute miles or 1.8 km).

Source: Ecology and Environment, Inc.

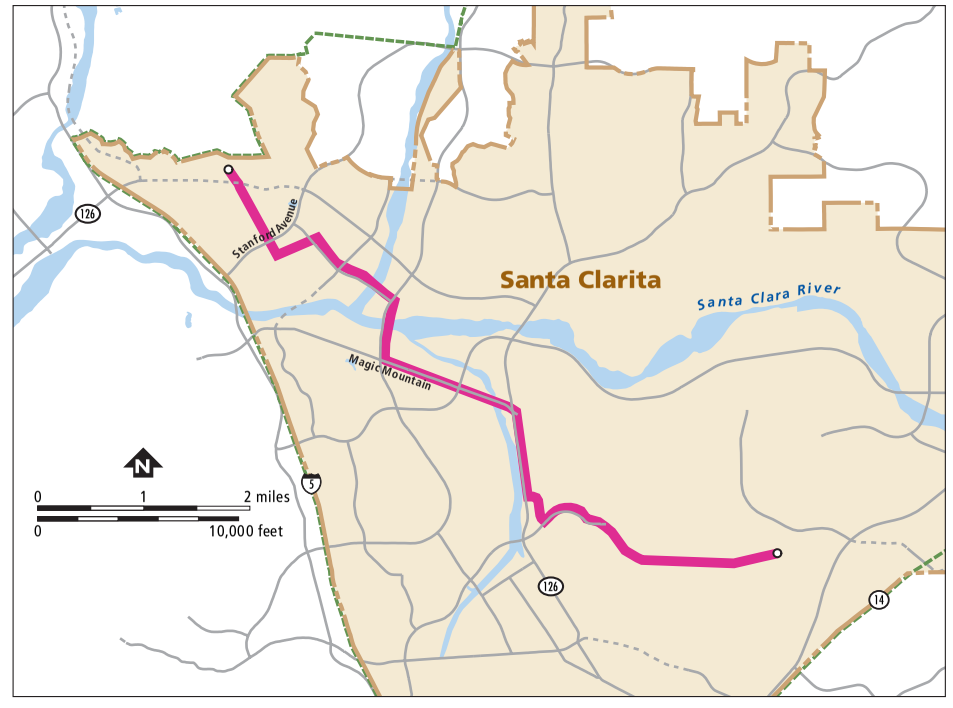




Center Road Pipeline

City of Oxnard and Ventura County

Additional pipeline system construction required to receive gas from Cabrillo Port



Line 225 Pipeline Loop

Santa Clarita, Los Angeles County

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Figure 2.1-1

Proposed Project Components

(see Figure 3.3-1 for alternatives considered)

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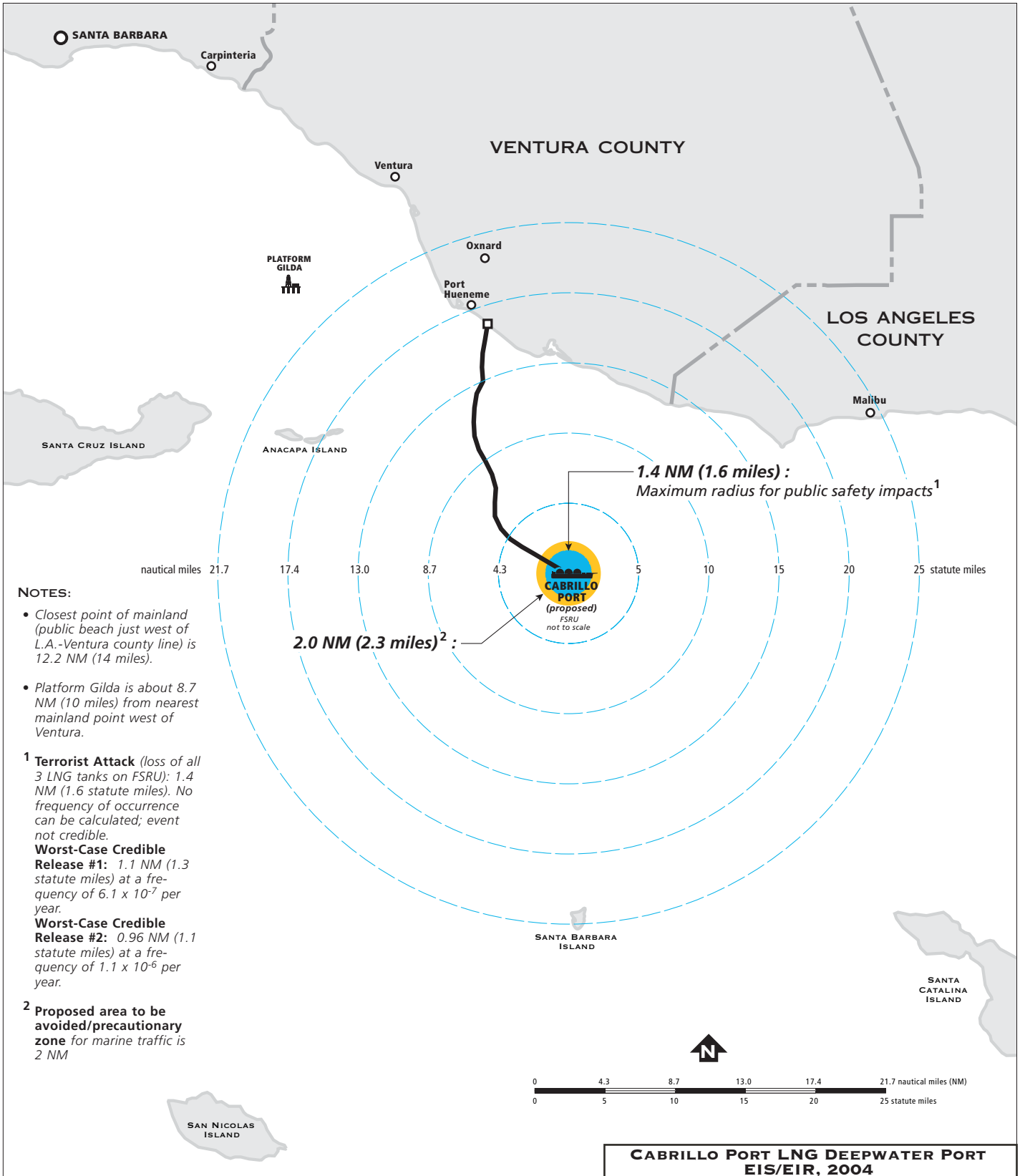
Source: Ecology and Environment, Inc., 2004



NOTES:

- *Closest point of mainland (public beach just west of L.A.-Ventura county line) is 12.2 NM (14 miles).*
- *Platform Gilda is about 8.7 NM (10 miles) from nearest mainland point west of Ventura.*

[1] **Terrorist Attack** *(loss of all 3 LNG tanks on FSRU): 1.4 NM (1.6 statute miles). No frequency of occurrence can be calculated; event not credible.*
Worst-Case Credible Release #1: *1.1 NM (1.3 statute miles) at a frequency of 6.1 x 10^{-7} per year.*
Worst-Case Credible Release #2: *0.96 NM (1.1 statute miles) at a frequency of 1.1 x 10^{-6} per year.*

[2] **Proposed area to be avoided/precautionary zone** *for marine traffic is 2 NM*

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Ecology and Environment, Inc. 001883.CA04.03.00.k (BHP Cabrillo Port folder) 10/20/2004

Figure 2.2-1

Distances from the FSRU to Major Points of Interest

Table 2.2-1 Location of Project Facilities

Facility and Purpose	General Location	Latitude (N)	Longitude (W)
FSRU *Receive and store liquefied natural gas from tankers; generate power to heat and regasify gas; send natural gas to shore via pipelines.*	Offshore; Federal waters	33º 51.52’	119º 02.02’
Mooring System *Fix FSRU to seabed*	Offshore; Federal waters	33º 51.52’	119º 02.02’
Riser pipeline-ending manifold (PLEM) *Provide a connection between the FSRU and the offshore pipelines*	Offshore; Federal waters	33º 52.2’	119º 04.06’
Offshore Pipelines *Transport natural gas to shore*	Offshore; Federal and State waters	Various	Various
Shore Crossing at Ormond Beach *Connect offshore pipelines to existing onshore infrastructure*	Ormond Beach, City of Oxnard, Ventura County, California (CA)	HDD entry: 34º 07.69’ HDD exit: 34º 07.19’	HDD entry: 119º 10.088’ HDD exit: 119º 10.69’
Onshore Pipelines *Transport natural gas*	Cities of Oxnard and Santa Clarita, Ventura and Los Angeles Counties	Various	Various
Metering Station at Ormond Beach *Measure and transfer ownership of natural gas*	Reliant Energy Ormond Beach Generating Station, City of Oxnard, Ventura County, CA	34º 07.97’	119º 09.94’
Center Road Valve Station *Safety and control*	Ventura County, CA	34º 09.83’	119º 03.40’
Quigley Valve Station Expansion *Safety and control*	Los Angeles County, CA	34º 14.35’	118º 17.96’
Honor Rancho Valve Station *Safety and control*	Los Angeles County, CA	34º 16.10’	118º 21.19’

1

2 Note: Latitude and Longitude have been rounded to the nearest 0.01’

Table 2.2-2 Land and Sea Requirements for Construction and Operation of the Cabrillo Port Project

Facility	Installation/Construction		Operation	
	Dimensions	Area	Land Affected	Area
Offshore				
FSRU – safety zone	500-m radius (0.27 NM or 1,640 feet) around FSRU	0.23 square NM (0.31 square miles [mi^2] or 0.78 square kilometers [km^2])	500-m radius (0.27 NM or 1,640 feet) around FSRU	0.23 sq. NM (0.31 mi^2 or 0.78 km^2)
FSRU – precautionary zone	2 NM (2.3 miles or 3.7 km) radius	12.6 sq. NM (16.6 mi^2 or 43 km^2)	2 NM (2.3 miles or 3.7 km) radius	12.6 sq. NM (16.6 mi^2 or 43 km^2)
Subsea transmission pipelines ROW	18.7 NM (21.5 miles or 34.6 km) by 200 feet (61 m)	511 acres (207 hectares [ha])	18.7 NM (21.5 miles or 34.6 km) by 200 feet (61 m)	511 acres (207 ha)
Onshore				
Shore Crossing	0.65 mile by 50 feet (1.05 km by 15.2 m); + 0.35 mile by 50 feet (0.56 km by 15.2 m)	6.1 acres (2.5 ha)	0.65 mile by 50 feet (1.05 km by 15.2 m); + 0.35 mile by 50 feet (0.56 km by 15.2 m)	6.1 acres (2.5 ha)
Aboveground facilities at Ormond Beach (metering station, station expansion and modifications, main line block valve etc.)	400 feet by 400 feet (121.9 m by 121.9 m)	3.7 acres (1.5 ha)	200 feet by 200 feet (61 m by 61 m)	0.9 acres (0.26 ha)
Onshore pipeline ROW – Center Road Pipeline[1]	14.3 miles by 80 feet (23.0 km by 24.4 m)	139.3 acres (56.4 ha)	14.3 miles by 50 feet (23.0 km by 15.2 m)	87.5 acres (35.4 ha)
Onshore pipeline ROW – Line 225 Pipeline Loop[1]	7.7 miles by 80 feet (12.4 km by 24.4 m)	74.8 acres (30.3 ha)	7.7 miles by 50 feet (12.4 km by 15.2 m)	46.6 acres (18.8 ha)
Center Road Valve Station Expansion	80 feet by 200 feet (24.4 m by 61 m)	0.4 acres (0.15 ha)	200 feet by 200 feet (61 m by 61 m)	0.9 acre (0.36 ha)
Quigley Valve Station Expansion	80 feet by 200 feet (24.4 m by 61 m)	0.4 acres (0.15 ha)	200 feet by 200 feet (61 m by 61 m)	0.9 acre (0.36 ha)
Honor Rancho Valve Station Expansion	80 feet by 200 feet (24.4 m by 61 m)	0.4 acres (0.15 ha)	200 feet by 200 feet (61 m by 61 m)	0.9 acre (0.36 ha)

[1] ROW width for both the Center Road Pipeline and the Line 225 Pipeline Loop may vary depending on the roadway type.

1

Table 2.2-3 Land Requirements for Temporary Staging Areas During Construction of the Cabrillo Port Project

Facility	Installation/Construction	
	Dimensions	Area
Onshore		
Ormond Beach HDD staging area	200 feet by 200 feet (61 m by 61 m)	0.9 acre (0.36 ha)
Pipeline staging areas – Center Road Pipeline	400 feet by 400 feet (121.9 m by 121.9 m)	3.7 acres (1.5 ha) per staging area; 11.1 acres (4.5 ha) total
Pipeline staging areas – Line 225 Pipeline Loop	400 feet by 600 feet (121.9 m by 182.9 m)	5.5 acres (2.2 ha) per staging area; 11 acres (4.4 5 ha) total
Watercourse crossings – Line 225 Pipeline Loop: Santa Clara River	800 feet by 225 feet (243.8 m by 68.6 m)	4.1 acres (1.66 ha)
Watercourse crossings – Line 225 Pipeline Loop: South Fork Santa Clara River, San Francisquito Creek	375 feet by 225 feet (114.3 m by 68.6 m)	1.9 acres (0.8 ha) per crossing, 3.8 acres (1.5 ha) total

To ensure that appropriate criteria would be used for the FSRU, the following steps would be taken: (1) the U.S. Coast Guard (USCG), in consultation with the California State Lands Commission (CSLC), would assess the proposed criteria and standards for the design, construction, and operation; and (2) a third-party verification agent, likely a recognized classification society approved by the USCG and the CSLC, would be used to evaluate and approve the proposed design and construction to agreed-upon standards. This is consistent with the Deepwater Port Act (DWPA), which allows for flexibility in design while maintaining appropriate safety standards.

A classification society establishes and applies technical requirements for the design, construction, and survey of marine-related facilities, principally ships and offshore structures, and maintains research departments for the ongoing development of technical safety standards. Classification rules are developed to contribute to the structural strength and integrity of essential parts of a ship's hull and its appendages and to assure the reliability and function of the power generation and other essential features and services. The owner of a ship that has been designed, built, and tested in accordance with the rules may apply for a certificate of classification indicating that the ship complies with the rules. Classification societies may also act as Recognized Organizations for Flag States.

2.3.1 Floating Storage and Regasification Unit

The preliminary design of the FSRU, described below, would be finalized by the Applicant upon license approval and would be built to conform to International Maritime Organization (IMO) standards. As discussed above, a third-party verification agent would certify the design. Features described in this section are shown in Figure 2.3-1.

2.3.1.1 Dimensions

The FSRU would be a vessel-shaped, double-hulled facility with three spherical storage tanks. The FSRU would be built specifically to transfer, store, and regasify LNG. It would measure 938 feet (286 m) long and 213 feet (65 m) wide, and displace approximately 190,000 deadweight tons. The freeboard (the distance from the waterline to the deck) would be about 57.4 feet (17.5 m). The LNG storage tanks would be approximately 22 feet (6.7 m) high, placing them 79.4 feet (24 m) above the waterline. The cold stack height, pending final design, would be approximately 250 feet (76 m) above the waterline and approximately 80 feet (24 m) above the top of the LNG storage tanks. The diameter of the cold stack would be 4 to 8 inches (0.1 to 0.2 m).

2.3.1.2 Hull

The steel hull would be designed with a bow and stern shape to minimize wave motion, thus providing a stable platform for operations. Ballast tanks would be located between the double hulls, while other tanks would be contained inside the inner hull. These tanks would store diesel fuel, lubricating oil, oily water, gray water (from sinks and showers), sanitary sewage, and potable water. The FSRU would be equipped with stern thrusters (at the aft, or back end, of the hull) for heading control only; it would not be able to steam under its own power.

2.3.1.3 LNG Receiving, Storage, and Regasification Facilities

Properties of Natural Gas to be Imported to the Project

The Applicant anticipates importing high quality natural gas to this Project when western Australia's Scarborough offshore gas field is developed and a liquefaction facility and terminal is constructed. The field, located on the Exmouth Plateau about 174 miles (280 km) off the western Australia coast in water about 2,953 feet (900 m) deep, reportedly contains about 8 trillion cubic feet (ft^3) (226.6 billion cubic meters [m^3]) of gas. The gas consists of about 95 percent methane, has very low carbon dioxide, and is anticipated to meet pipeline-quality gas requirements imposed by SoCalGas with no additional treatment (Alexander's Gas and Oil Corporation March 10, 2004). However, if the Project comes on-line before the Scarborough field wells are operational, the Applicant has stated that it would import natural gas from other sources (Billiot August 27, 2004).

Information provided by the Applicant indicates that the LNG imported to the Project would be of pipeline-quality, regardless of the natural gas source. The natural gas quality would be tested three times: (1) prior to receipt by the FSRU from the LNG carrier; (2) prior to transmission from the FSRU to shore; and (3) at the Reliant Energy Ormond Beach Metering Station. At each of these testing points the gas may be rejected if it does not meet pipeline-quality requirements. Records of gas quality would be maintained by the Applicant at the FSRU and by SoCalGas.

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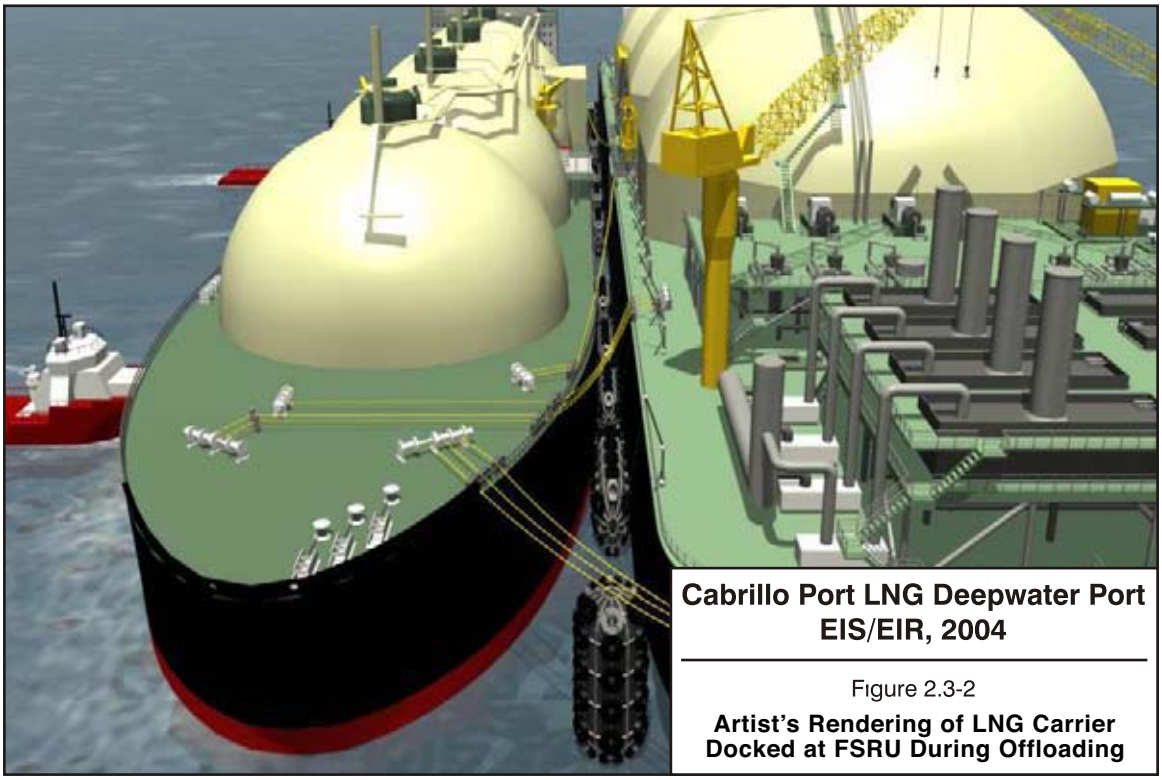
Figure 2.3-1

Artist's Rendering of FSRU



Cabrillo Port LNG Deepwater Port EIS/EIR, 2004

Figure 2.3-2

Artist's Rendering of LNG Carrier Docked at FSRU During Offloading

SOURCE: Entrix 2004